

## NOTICE

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The first five volumes of the Minutes of Evidence taken before the Indian Cotton Committee, 1917-19 were issued in 1920. The accompanying Volume VI—Appendix contains Maps and Diagrams pertaining to the Evidence recorded during the Enquiry and should be added to the volumes previously issued.

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# MINUTES OF EVIDENCE

TAKEN BEFORE THE

## INDIAN COTTON COMMITTEE

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VOLUME VI

APPENDIX

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MAPS AND DIAGRAMS



CALCUTTA  
SUPERINTENDENT GOVERNMENT PRINTING, IN  
1920

1. 1. The first part of the paper is devoted to a discussion of the  
2. various methods of determining the rate of reaction.  
3. The second part is devoted to a discussion of the  
4. various methods of determining the order of reaction.  
5. The third part is devoted to a discussion of the  
6. various methods of determining the activation energy.  
7. The fourth part is devoted to a discussion of the  
8. various methods of determining the equilibrium constant.  
9. The fifth part is devoted to a discussion of the  
10. various methods of determining the rate of reaction.

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2. 2. - Handwritten text in Urdu/Arabic script

הנהגתו היתה כדלהלן: הוא היה מורה על ידי חסידיו  
לעבוד את המלאכה שלו ביום ראשון ובימי חול  
במקום שבו היה עובד, והוא היה מורה להם  
לעבוד גם ביום ראשון ובחולות.

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14. For the purpose of the present Act, the following definitions shall apply:—  
 (a) "the Act" means the Indian Act, 1876, as amended; and  
 (b) "the Regulations" means the Indian Regulations, 1880, as amended.

for 1901 - 1902, by which it was suggested that the Division "shall" April to June  
of each year be the period of the year, for the Survey, Department of Engineering, Department of Civil  
Engineering, Vol. 111, pages 120-121.

1. 74. Report of work of the supply of the Division for September and October  
1914, Vol. 4, with a sketch of the E. R. Harvey, Supply Working Engineer, District Office,  
P.O. No. 111, pages 125-131)

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For 59 fragments of the pier and fall of the River Chutab in 1915-16 at Alexandra Bridge.  
(Enclosure IV to written evidence of Mr. C. G. May, Executive Engineer, Project Division, Lower  
Chutab Canal, Punjab. Vol. III, pages 132-133.)

*Polymer Letters*

[illegible]

10. 25. Duration of water supply and amount of supply in the Sidhal Canal for 1915-16.  
(Annexure VI) to written order of Mr. C. G. May, Executive Engineer, Project Division, Lower  
Chenab Canal, Punjab. Vol. III, pages 132-133.)

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100. 87 Working record of the Lower Indus Canal, 1915-16.  
(Annals IX in written evidence of Mr. C. H. May, Executive Engineer, Project Division, Lower  
Indus Canal, Punjab. Vol. III, pages 132-133.)

(Annex N to written evidence of Mr. C. G. May, Executive Engineer, Project Division, Lower Chenab Canal, Punjab. Vol. III, pages 132-139.)

(Annexure N) to written evidence of Mr. C. G. May, Executive Engineer, Project Division, Lower

(Annexure III to written evidence of Mr. C. G. May, Executive Engineer, Project Division, Lower Chenab Canal, Punjab. Vol. III, pages 132-139.)

No. 41:- Diagrams showing efficiency attained by using Kennedy gauge outlets on Lower Chenab Canal.  
(Annexure II to oral evidence of Mr. C. G. May, Executive Engineer, Project Division, Lower Chenab Canal, Punjab. Vol. III, pages 140-142.)

No. 42 - Diagram showing comparative costs per acre per crop for irrigation by ordinary wells and by tube wells.

Ann. 42 = Diagrams showing hydrographs of the River Indus at Bukkur and Kotri, Sind.  
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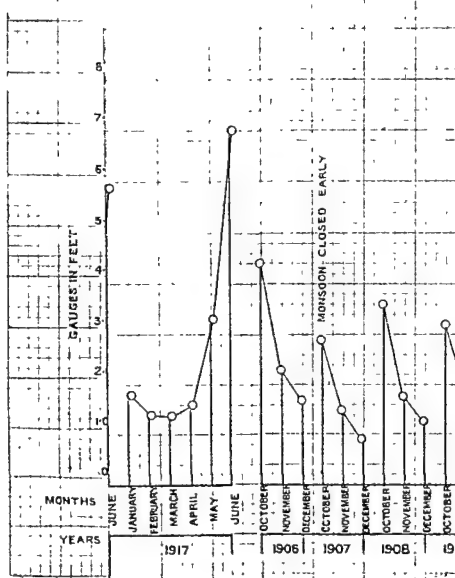
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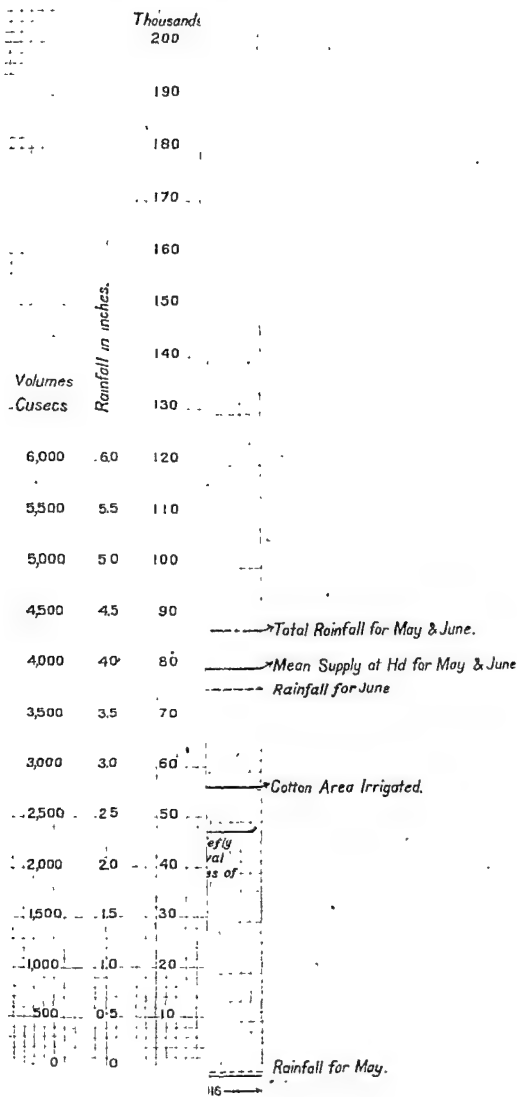
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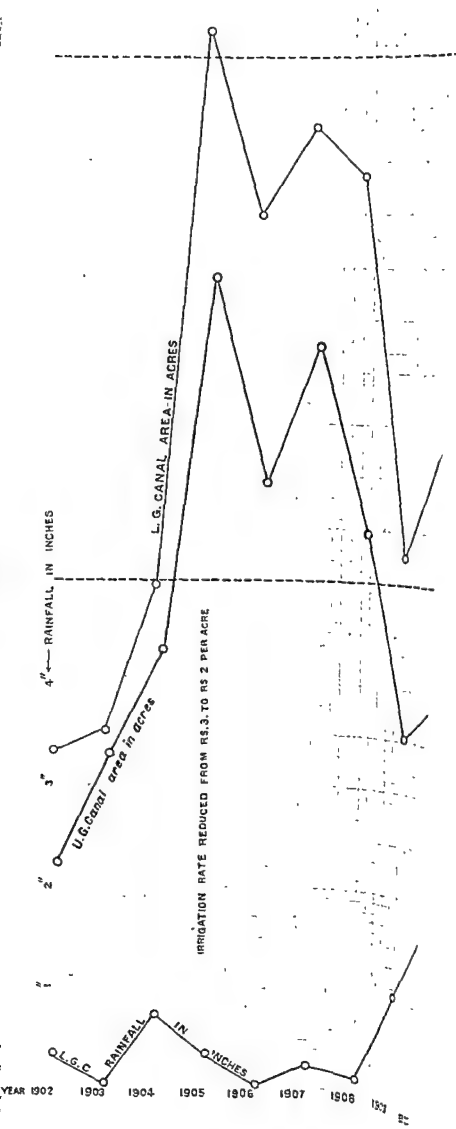
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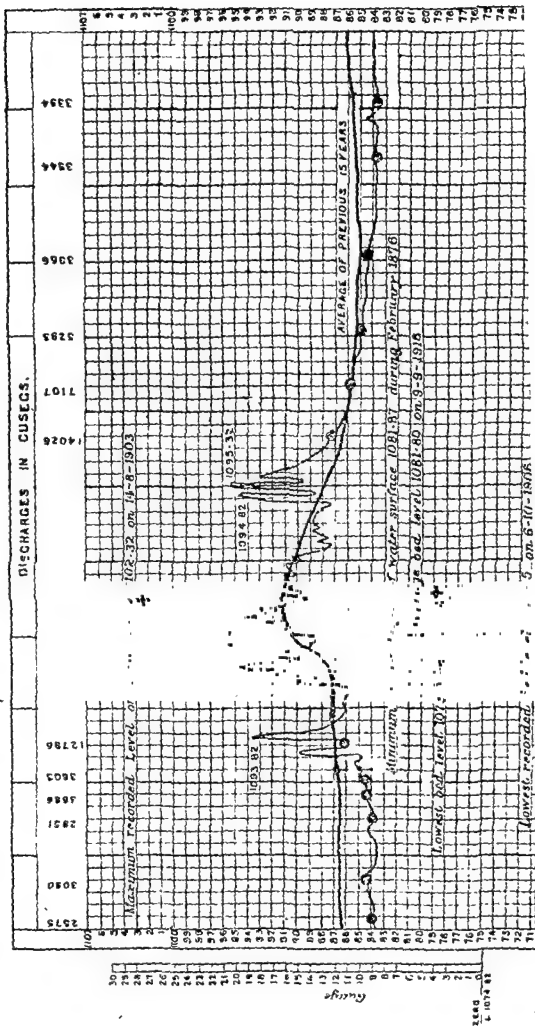
YEAR 1902







*Note - The discharges at ⑤ were actually observed.*













No. 7. Annexure I to evidence of Mr. A. S. Gibb, Executive Engineer, Upper Bari Doab Canal, Punjab.

DIAGRAM SHOWING CURVE OF EACH SUPPLY FAVOURABLE TO AMERICAN COTTON.

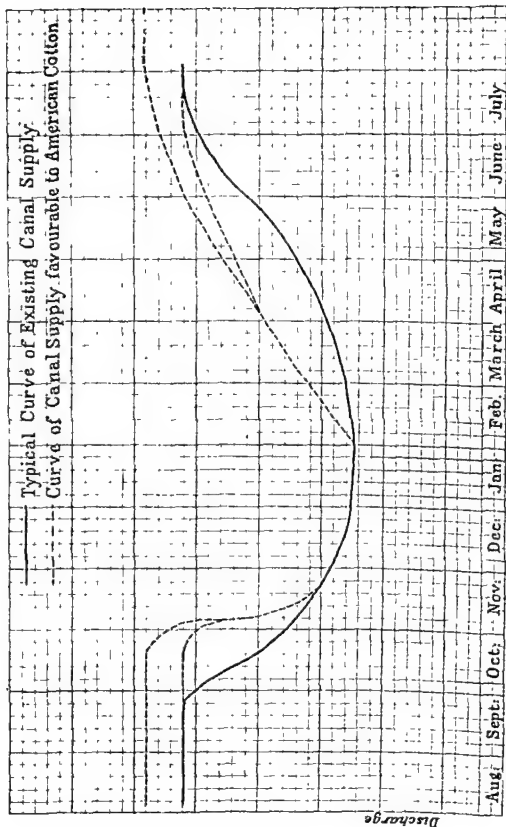


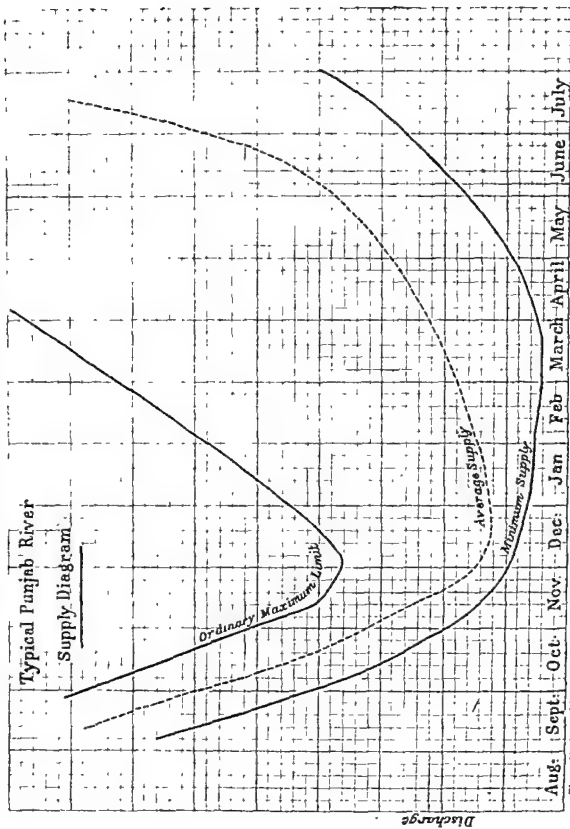
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March, 1950.—No. 5555.12.1500.





TYPICAL PUNJAB RIVER SUPPLY DIAGRAM.

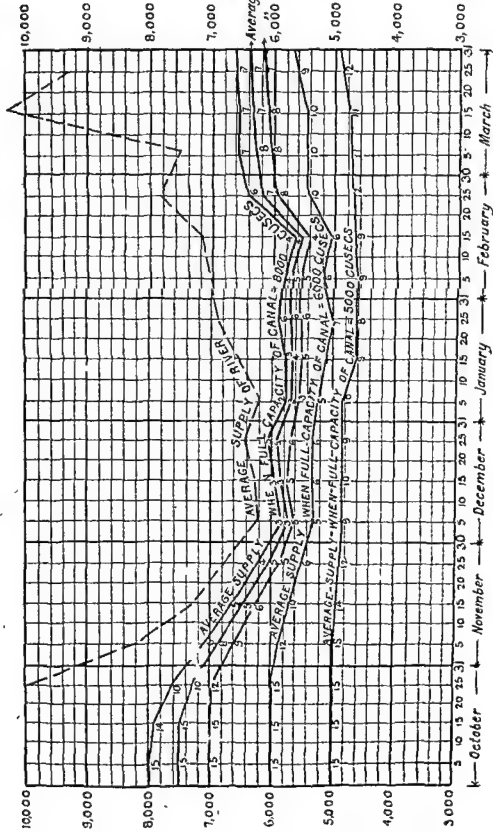




No. 9. Annexure III to evidence of I. A. S. GIRDHAR, Engineer, Upper Bari Doab Canal, Punjab.

DIAGRAM SHOWING AVERAGE RABI SUPPLIES THAT CAN BE TAKEN BY CANALS  
OF DIFFERENT FULL CAPACITY  
RABI

AVERAGE BASED ON FIGURE FOR TENDAY PERIODS FOR 15 YEARS 1902-03 TO 1916-17.



Average Rabi supplies for Canals of different Full Capacities based on record of 15 Years (Black)  
Canal of 8000 cusecs Capacity will take 6463 cu  
" 7500 " " " 6249  
" 7000 " " " 6019  
" 6000 " " " 5482  
" 5000 " " " 4820

Average supply when Full Capacity of Canal = 7500 Cus  
" " " " = 7000 "

N.B. Numbers on curves indicate for each half n  
The number of years out of a total of 15 year  
which the available river supply equals or ex  
ceeds the full capacity of the Canal.

A. S. GIBB,

Excavations Engineer,

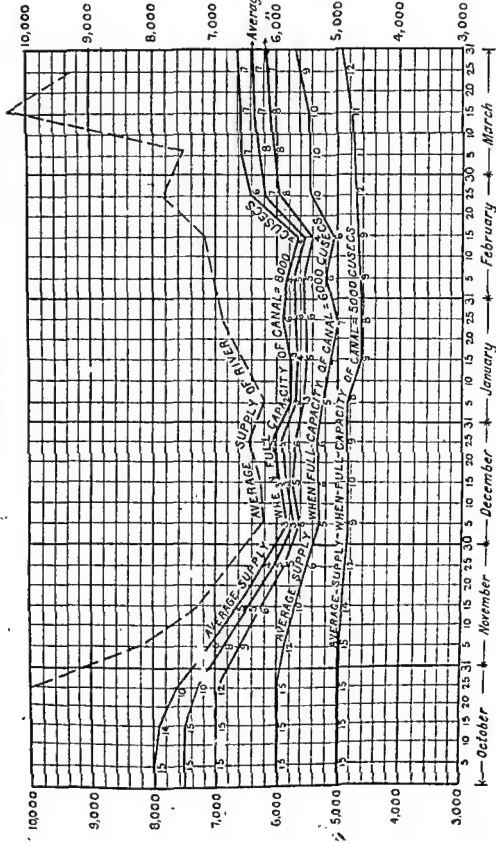
Photo. Zinco, February, 1920 ~ 2



# DIAGRAM SHOWING AVERAGE RABI SUPPLIES THAT CAN BE TAKEN BY CANALS OF DIFFERENT FULL CAPACITY

## RABI

AVERAGE BASED ON FIGURE FOR TENDAY PERIODS FOR 15 YEARS 1902-03 TO 1916-17.



Average Rabi supplies for Canals of different Full Capacities based on record of 15 Years (Based on 8000 cusecs Capacity will take 6429 cusecs)

|      |   |   |   |   |      |
|------|---|---|---|---|------|
| 7500 | " | " | " | " | 6249 |
| 7000 | " | " | " | " | 6019 |
| 6000 | " | " | " | " | 5482 |
| 5000 | " | " | " | " | 4820 |

Average supply when Full Capacity of Canal = 7500 Cusecs

|   |   |   |   |   |   |
|---|---|---|---|---|---|
| " | " | " | " | " | " |
| " | " | " | " | " | " |
| " | " | " | " | " | " |
| " | " | " | " | " | " |

N.B. Numbers on curves indicate for each half m The number of years out of a total of 15 year which the available river supply equals or exceeds the full capacity of the Canal.

3,000 DATUM LINE.

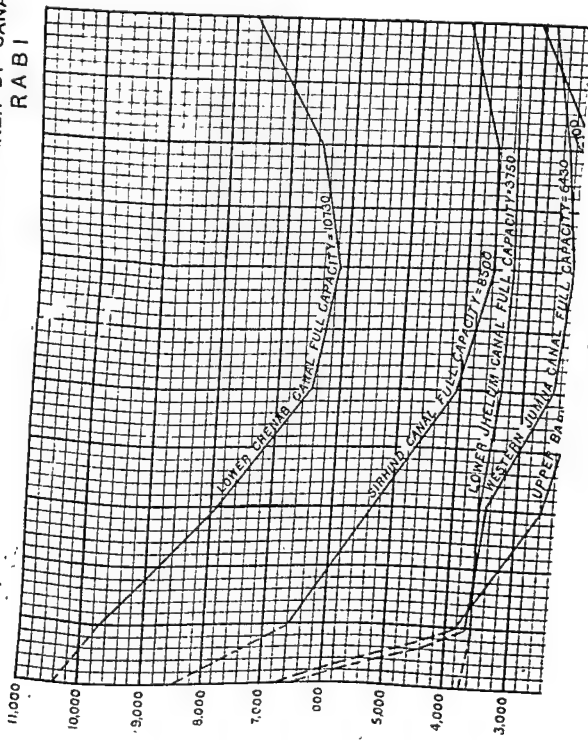
October November December January February March

A. S. GIBB,  
Executive Engineer,

Photo. Zinco, February, 1920 — N



Engineer, Upper Bari Doab Canal, Punjab.  
 DIAGRAMS SHOWING AVERAGE MONTHLY SUPPLIES  
 TAKEN BY CANALS  
 RABI



Averages of 16 years 1899-00 to 1914-15 except 1904-05 to 1905-06 which is averaged for 10 years only

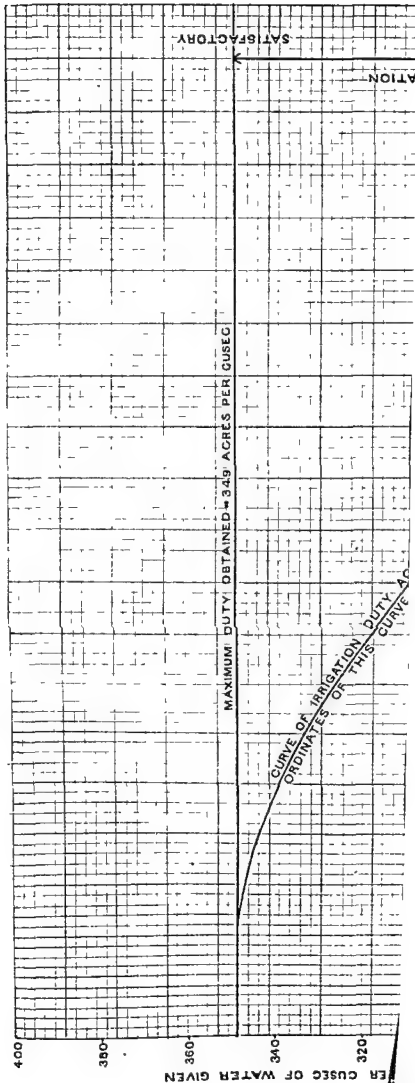
|                 | FULL CAPACITY<br>OF CANAL.<br>(a) | AVERAGE<br>RABII SUPPLY<br>(b) |
|-----------------|-----------------------------------|--------------------------------|
| Western Jumna   | 10730                             | 2889                           |
| Sirhind         | 8500                              | 4583                           |
| Upper Bari Doab | 6700                              | 2613                           |
| Lower Chenab    | 10130                             | 7435                           |
| Lower Jhelum    | 3750                              | 3334                           |



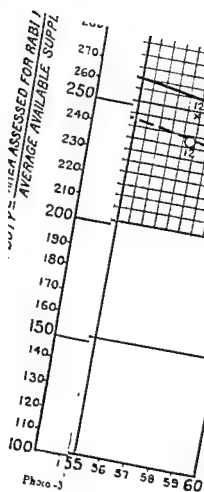
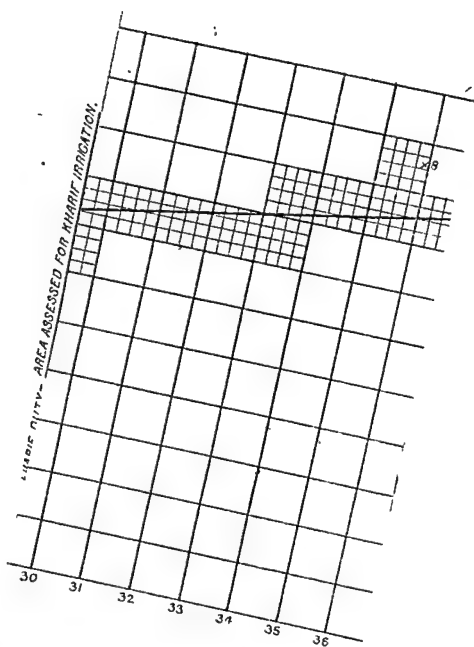


No. 11. Annexure V to evidence of I. A. S. Gubb, Executive Engineer, Upper Bari Doab Canal, Punjab.

**DIAGRAM SHOWING COMPARATIVE EFFICIENCIES OF IRRIGATION DONE FOR VARYING DEGREES OF LIBERALITY OF WATER SUPPLY ALLOWED DERIVED FROM OBSERVATIONS MADE ON LOWER CHENAB CANAL PUNJAB-INDIA.**







- 2. Delhi
  - 3. Rohtak
  - 4. Hissar
  - 5. Ferozepur
  - 6. Bhatinda
  - 7. II. Division Upper
  - 8 III. "
  - 9. IV. "
- (Only)



# MINOR WORKS KHARIF CROPS.

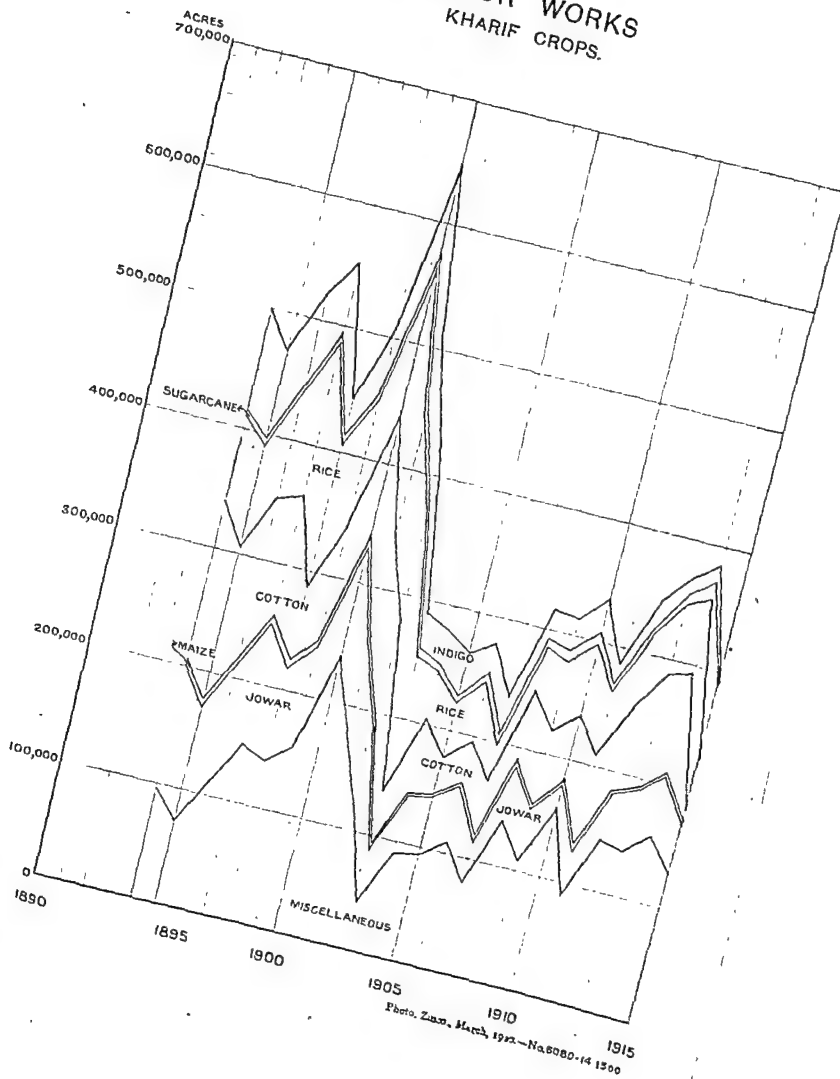
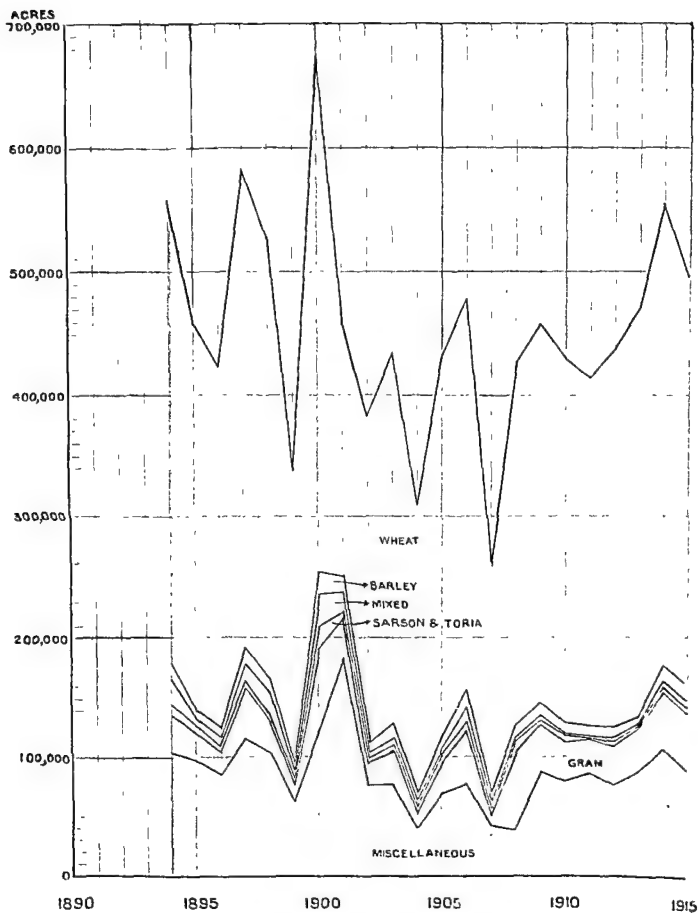


Photo. Zoon, March, 1912—No. 6080-14 1500



PUNJAB CANALS  
MINOR WORKS  
RABI CROPS.



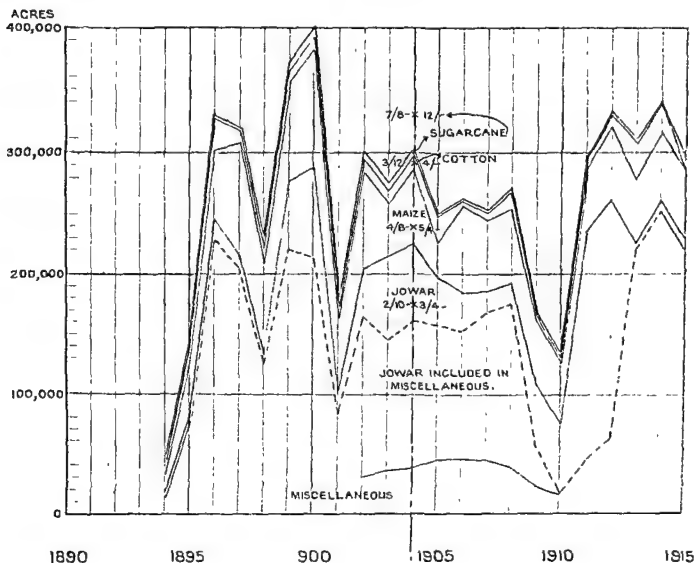




No. 18. Annexure VII to written evidence of Mr. H.W. Nicholson,  
Executive Engineer, Sirhind Project Division, Punjab.

# PUNJAB CANALS SIRHIND CANALS

(MAJOR WORKS)  
KHARIF CROPS  
BRITISH BRANCHES.



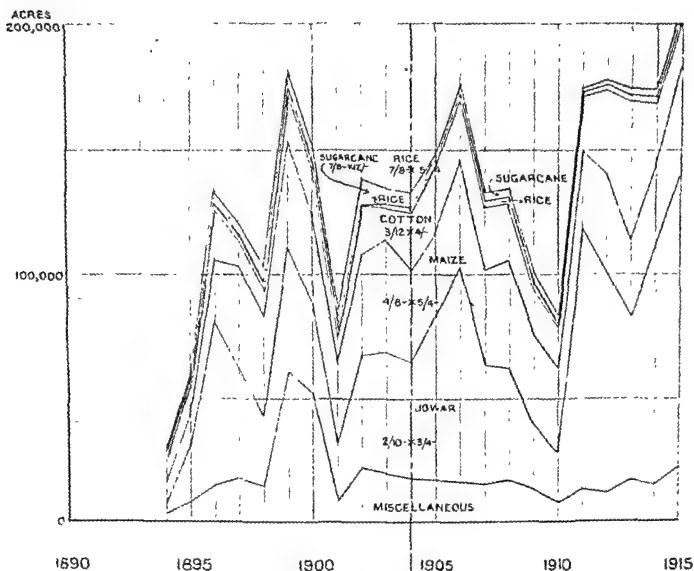
NOTIFICATION FOR CANAL WATER RATE

6516 30/27/1/88 x 2733 30/21/2/04



No. 19. Annexure VIII to written evidence of Mr. H.W. Nicholson,  
Executive Engineer, Sirhind Project Division, Punjab.

PUNJAB CANALS  
SIRHIND CANALS  
(MAJOR WORKS)  
KHARIF CROPS  
NATIVE STATES.



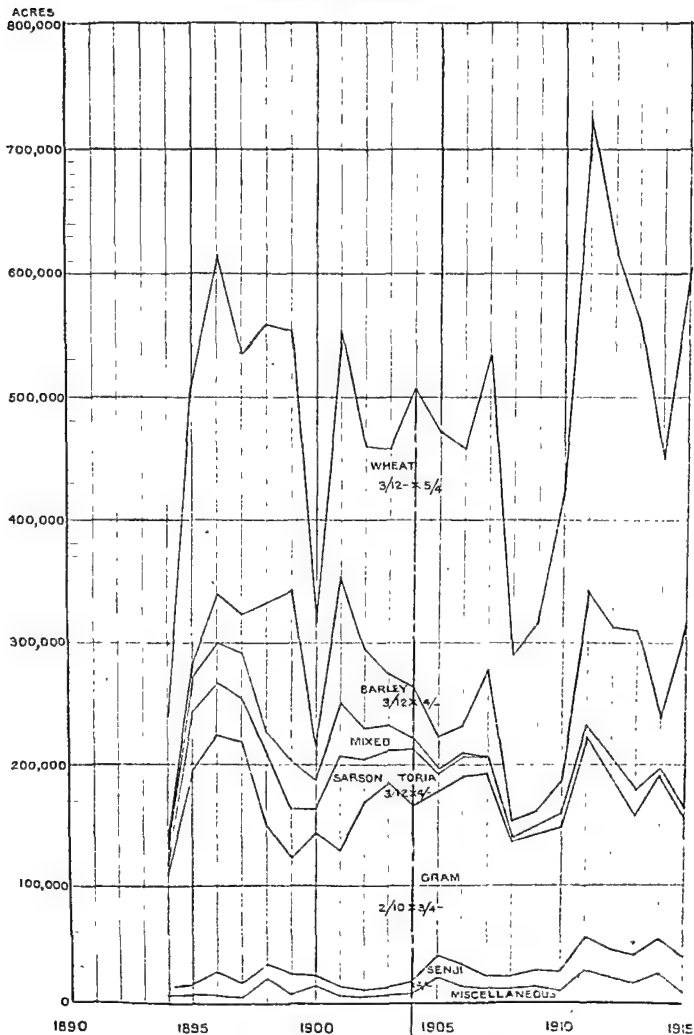
NOTIFICATION FOR CANAL WATER RATE

6516 S. D/-27/11/88 x 273 S. D/-21-12-1904



# SIRHIND CANALS

(MAJOR WORKS)  
RABI CROPS  
BRITISH BRANCHES.



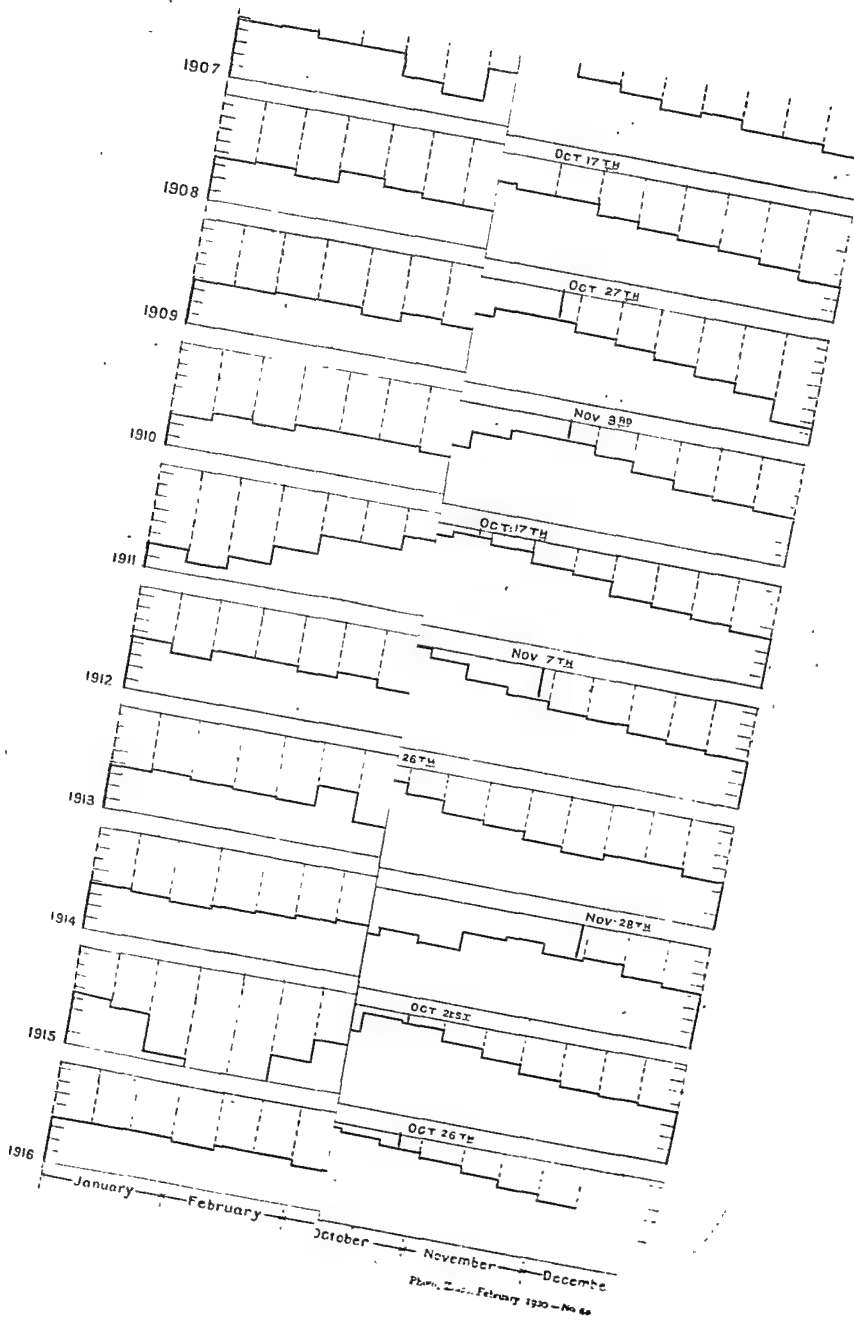
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6616 D/-27-11-82 & 273 D/-21-12-1904





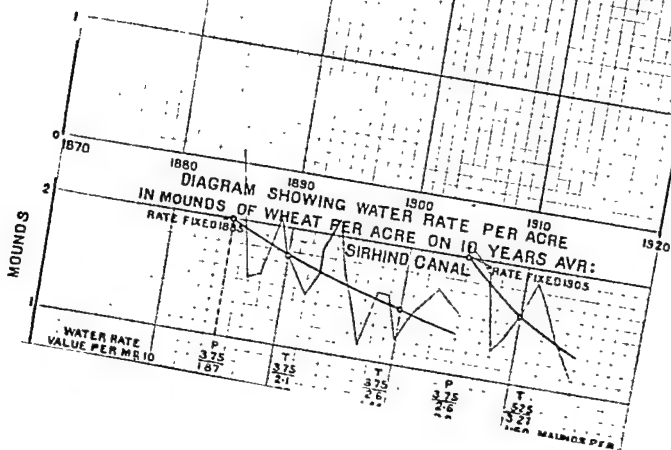
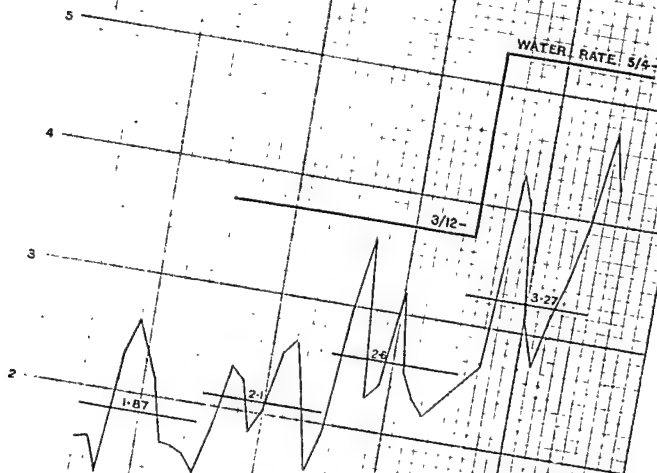




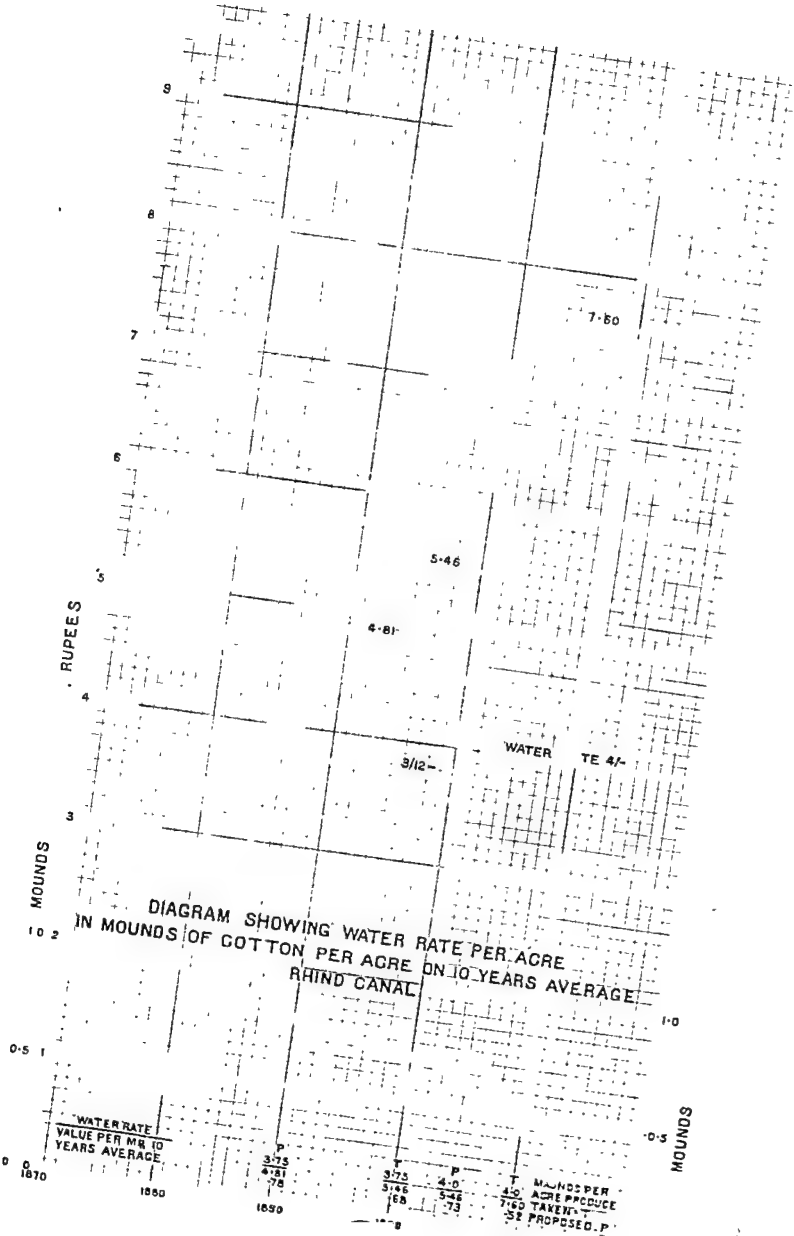




LUDHIANA DISTRICT





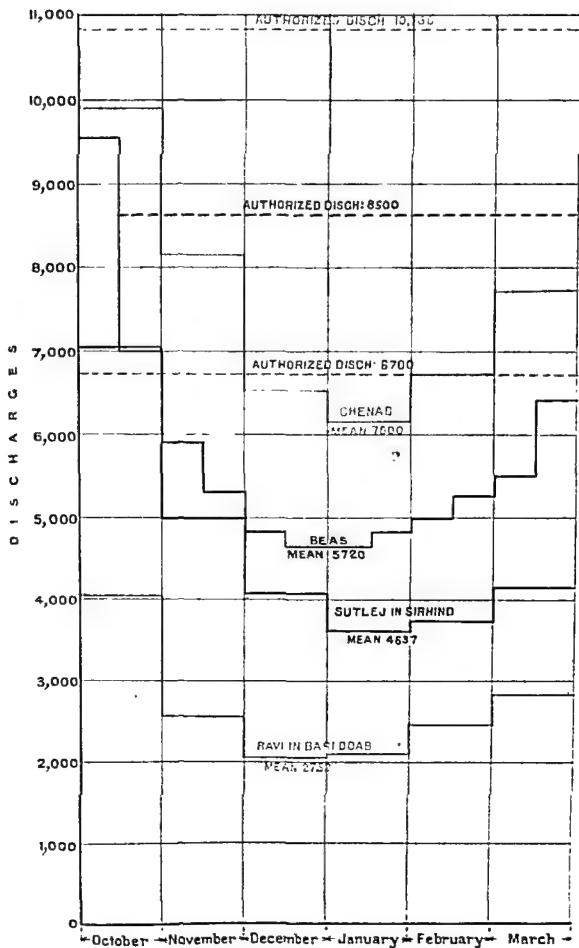




# 11 YEARS MEAN 1903-14

MEASURED IN CANAL

(EXCEPT BIAS).









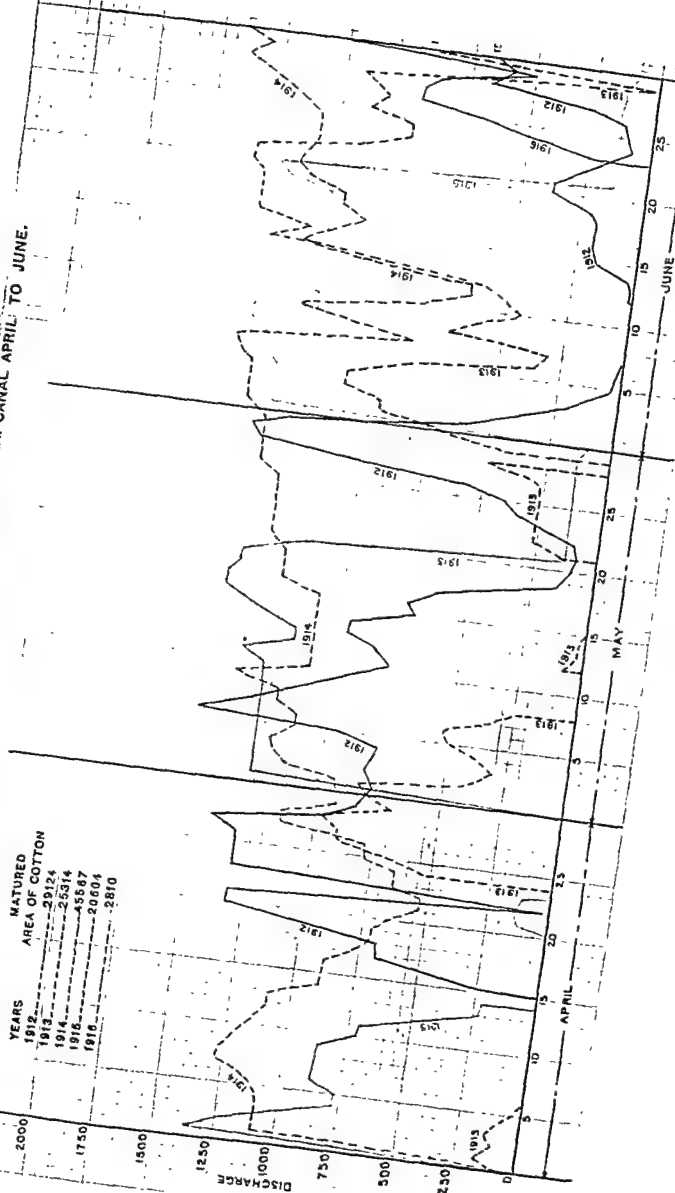






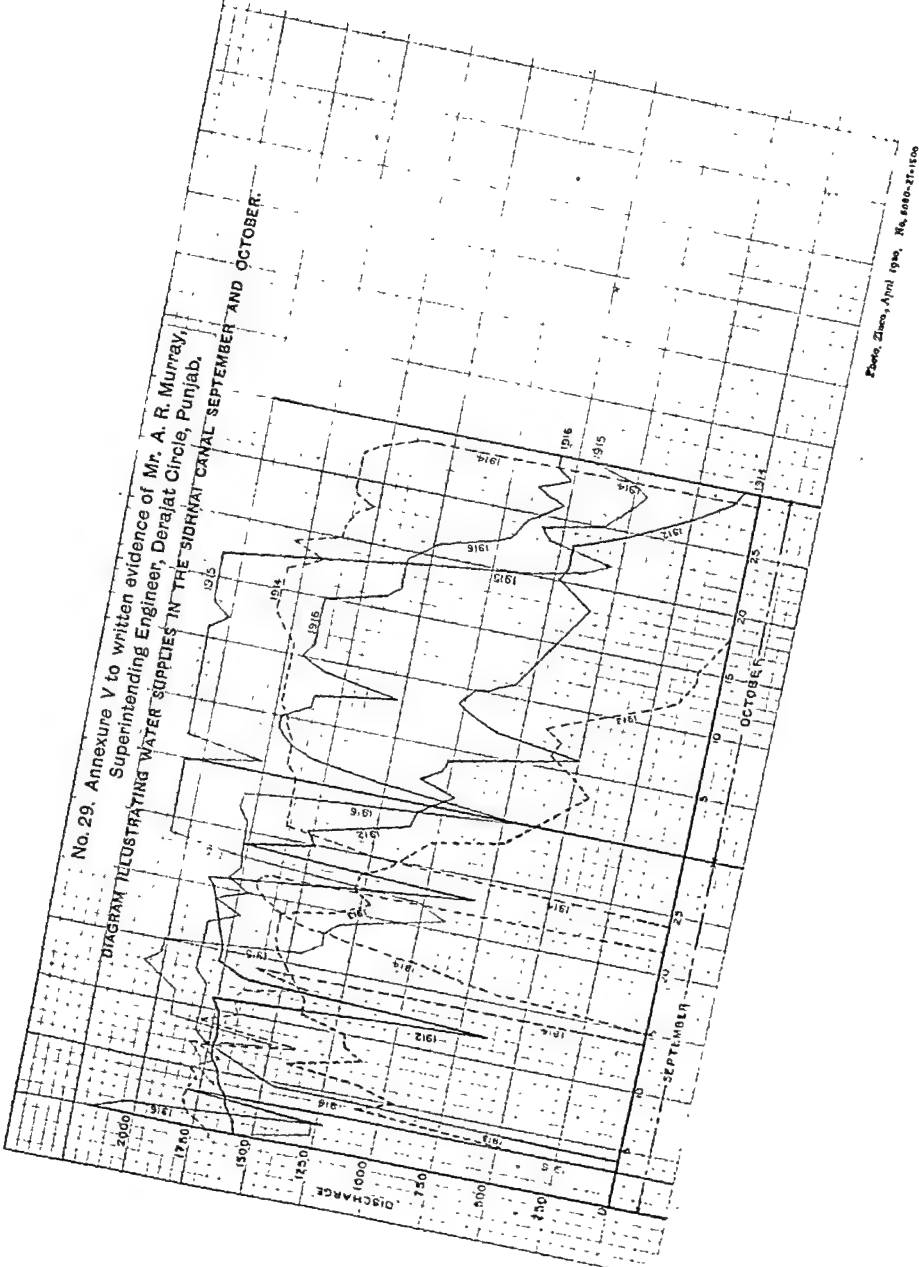
No. 28. Annexure IV to written evidence of Mr. A. R. Murray,  
Superintending Engineer, Derajat Circle, Punjab.  
DIAGRAM ILLUSTRATING WATER SUPPLIES IN THE SIDHNAI CANAL APRIL TO JUNE.

| YEARS | MATURED<br>AREA OF COTTON |
|-------|---------------------------|
| 1912  | 29124                     |
| 1913  | 25324                     |
| 1914  | 25324                     |
| 1915  | 25514                     |
| 1916  | 20607                     |
| 1917  | 20604                     |
| 1918  | 2810                      |





No. 29. Annexure V to written evidence of Mr. A. R. Murray,  
Superintending Engineer, Derajat Circle, Punjab.  
DIAGRAM ILLUSTRATING WATER SUPPLIES IN THE SIDHAI CANAL SEPTEMBER AND OCTOBER.

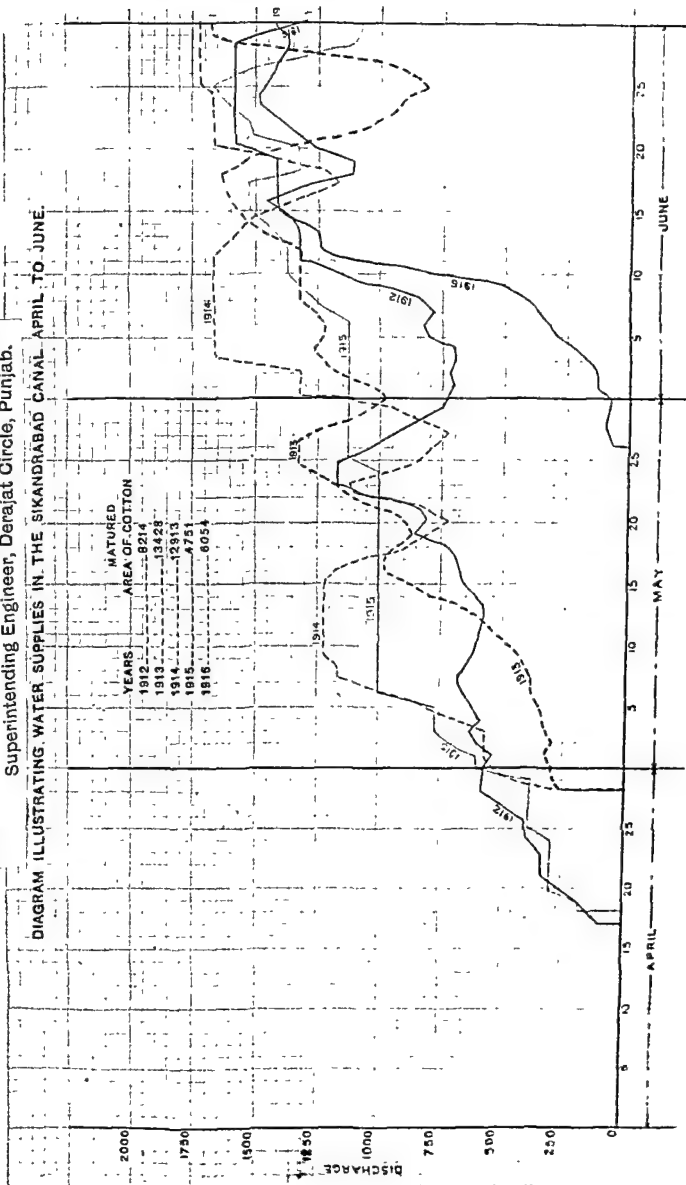






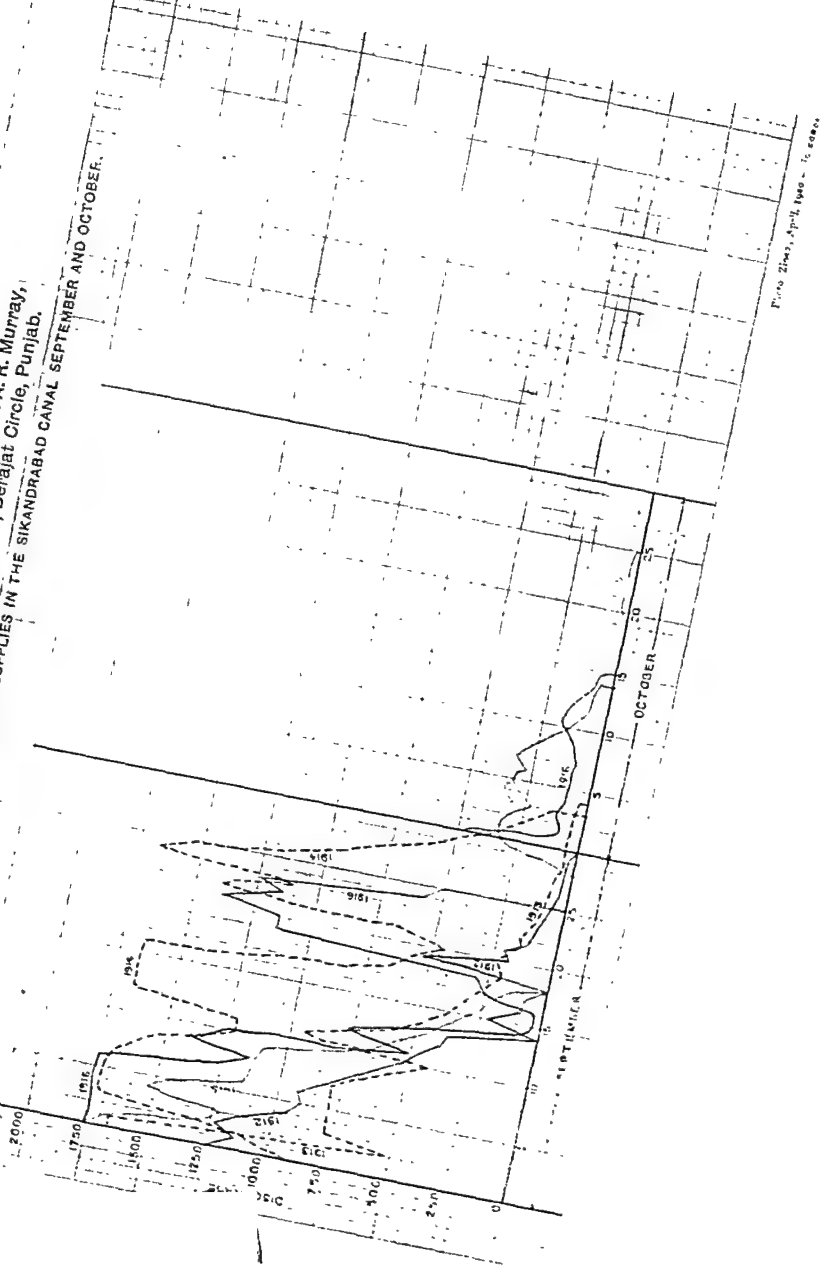
No. 30. Annexure VI to written evidence of Mr. A. R. Murray,  
Superintending Engineer, Derajat Circle, Punjab.

DIAGRAM ILLUSTRATING WATER SUPPLIES IN THE SIKANDRABAD CANAL APRIL TO JUNE.





No. 31. Annexure VII to written evidence of Mr. A. R. Murray,  
Superintending Engineer, Derajat Circle, Punjab,  
DIAGRAM ILLUSTRATING WATER SUPPLIES IN THE SIKANDRABAD CANAL SEPTEMBER AND OCTOBER.



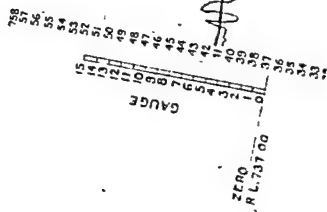


No.32. Annexure IV to written evidence of Mr. C. G. May,  
Executive Engineer, Project Division, Lower Chenab  
Canal, Punjab.

# RISE AND FALL OF THE RIVER CHENAB 1915-1916

## AT ALEXANDRA BRIDGE.

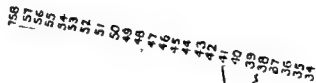
DISCHARGES IN CUSECS



MAXIMUM RECORDED LEVEL OF WATER SURFACE 752.2 ON 24.7.1903

MAXIMUM RECORDED LEVEL OF WATER SURFACE 736.0 ON 16.2.1913

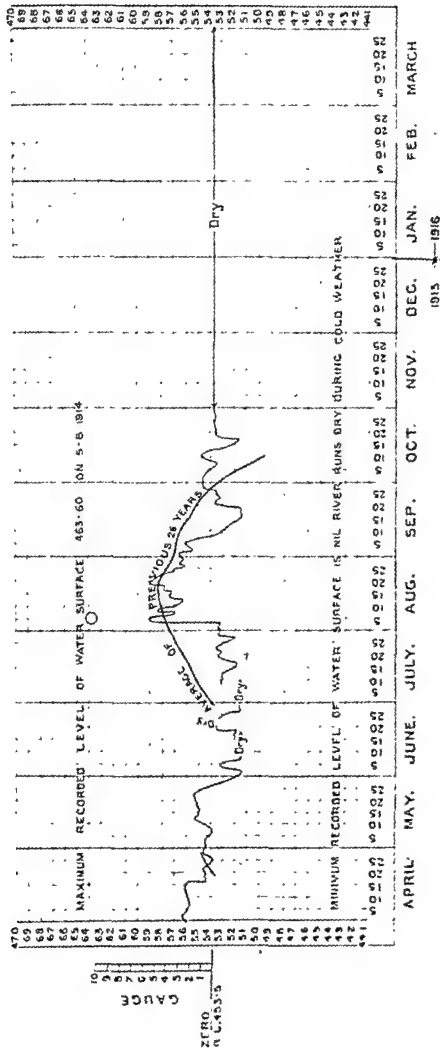
AVERAGE OF PREVIOUS 31 YEARS





No. 33. Annexure V to written evidence of Mr. C. G. May,  
Executive Engineer, Project Division, Lower Chenab  
Canal, Puniab.

RISE AND FALL OF THE RIVER RAVI 1915-1916  
BELOW SIDHAI DAM.



C. R. MAY,  
Executive Engineer,  
Project Division Lower Chenab Canal,  
8th December, 1917.  
Photo, Zaira, March, 1920 - No. 6080 311520





NOTE.

APRIL FEBRUARY

**MARCH**

CHANGE IN CUSECS

IRIGATED

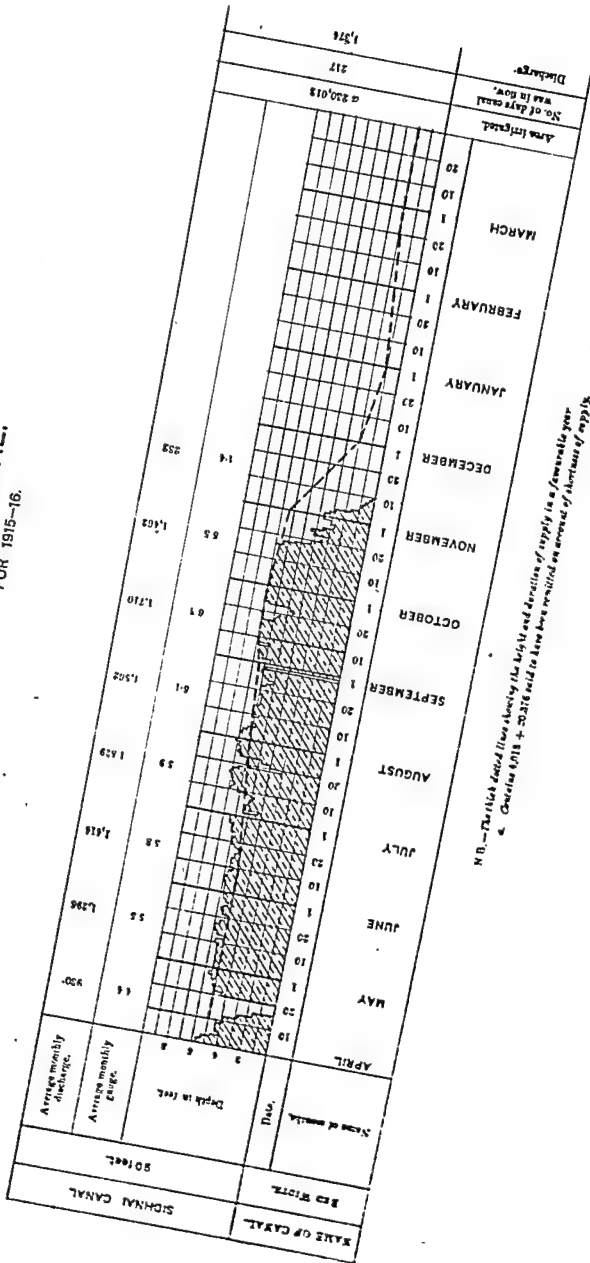
RGE IN CUSECS



No. 35. Annexure VII to written evidence of Mr. C. G. May,  
Executive Engineer, Project Division, Lower Chenab  
Canal, Punjab.

# DIAGRAM SHOWING THE DURATION AND AMOUNT OF SUPPLY IN THE SIDHNAI CANAL.

FOR 1915-16.





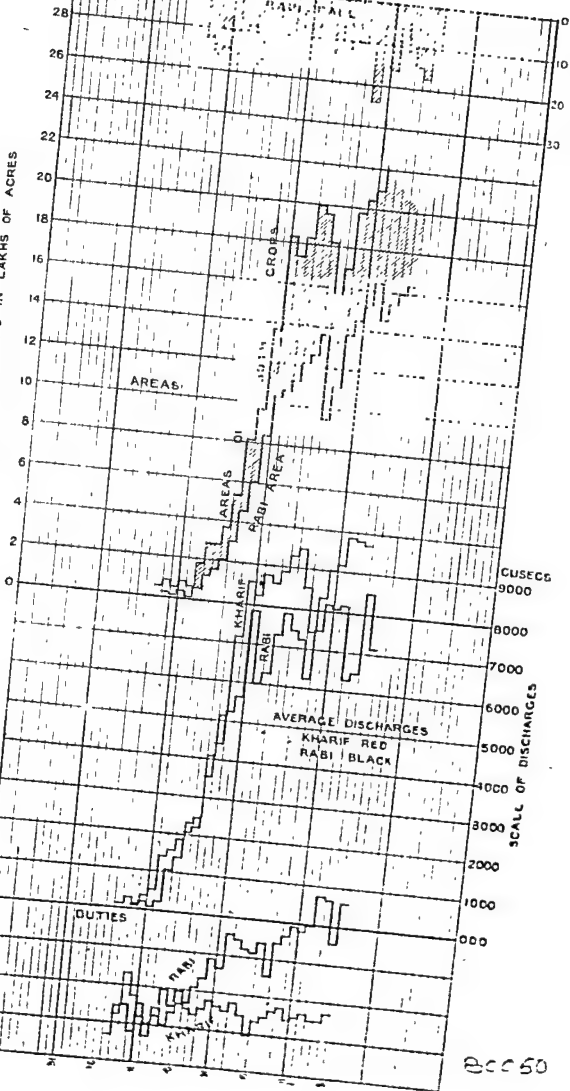
# WORKING RECORD

1915-16.

ACRES  
LAKHS 30

SCALE OF RAINFALL  
IN INCHES

SCALE OF AREAS IN LAKHS OF ACRES

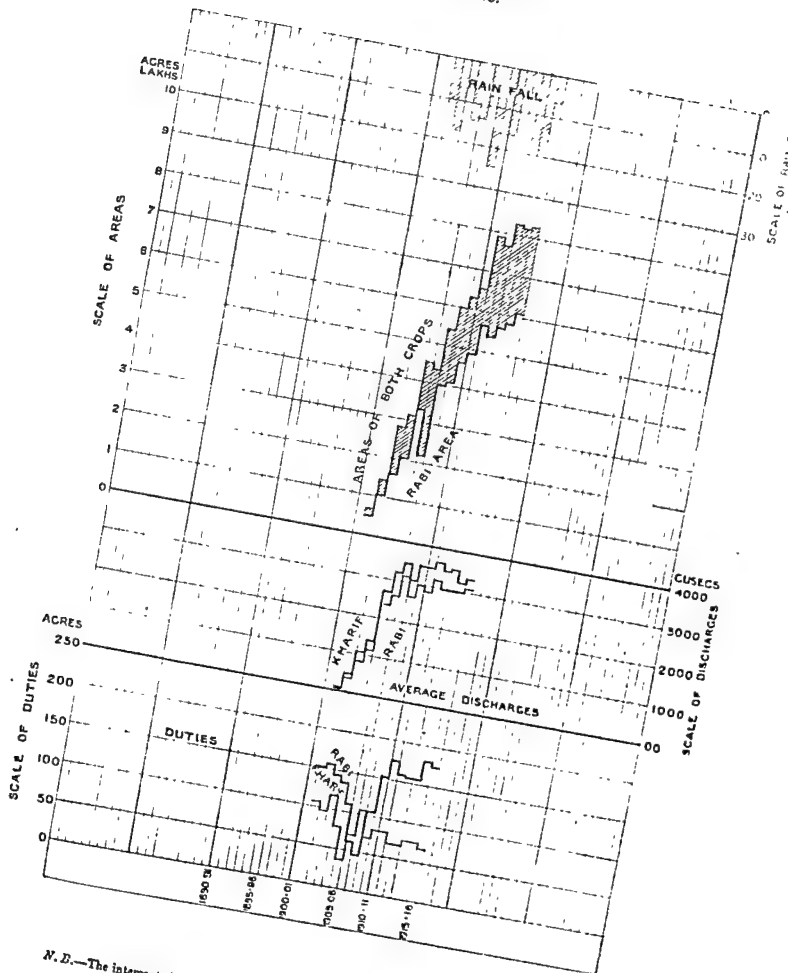


SCALE OF DUTIES  
ACRES  
200  
150  
100  
50  
0

20050



# WORKING RECORD 1915-16.



*N. D.*—The intercepts in red area give the Kharif irrigation each year. The discharges are measured at mile 14 of the main canal and give averages for each crop. The duties are derived from these areas and discharges.





DIAGRAM COMPARING THE PERCENTAGES OF THE CHIEF CROPS IRRIGATED BY  
VARIOUS CANALS IN THE PUNJAB DURING THE YEAR 1915-16.

|       | WESTERN<br>JUMNA<br>CANAL                       | SIRHIND<br>CANAL<br>BRITISH | UPPER<br>BARUDDAB<br>CANAL                                    | LOWER<br>CHENAB<br>CANAL                             | LOWER<br>JHELUM<br>CANAL                             | UPPER<br>CHENAB<br>CANAL  | LOWER<br>BARUDDAB<br>CANAL        | SIRHIND<br>CANAL                              |
|-------|---|-----------------------------|---|--|--|---------------------------|-----------------------------------|---|
| 100 % | OTHERS<br>FOODER<br>GRAINS<br>13.3 %            | FOODER<br>GRAINS<br>13.3 %  | OTHERS<br>SUGARCANE<br>2.8 %<br>OIL SEEDS<br>4.3 %            | OTHERS<br>FOODER<br>GRAINS<br>AND<br>COTTON<br>8.4 % | OTHERS<br>FOODER<br>GRAINS<br>AND<br>COTTON<br>8.7 % | FOODER<br>GRAINS<br>9.2 % | COTTON<br>AND<br>MELONS<br>11.0 % | OIL SEEDS<br>AND<br>FOODER<br>GRAINS<br>7.2 % |
| 90 %  | SUGARCANE<br>7.4 %<br>FOODER<br>GRAINS<br>8.9 % |                             | FOODER<br>GRAINS<br>6.5 %<br>COTTON<br>AND<br>MELONS<br>9.2 % | OIL SEEDS<br>11.0 %                                  | OIL SEEDS<br>11.9 %                                  | OIL SEEDS<br>9.6 %        | FOODER<br>GRAINS<br>11.5 %        | COTTON<br>AND<br>MELONS<br>11.5 %             |
| 80 %  |   | FOODER                      |   |  |  |                           |                                   |   |
| 70 %  |   | 27 %                        | FOODER<br>19.4 %  | FOODER<br>14.3 %                                     |  |                           | OIL SEEDS<br>18.6 %               | FOODER<br>17.5 %                              |
| 60 %  |   |                             |   |  |  |                           |                                   |   |
| 50 %  |   |                             |   |  |  |                           |                                   |   |
| 40 %  | FOOD  | FOOD                        | FOOD  | FOOD   | FOOD   | FOOD                      | FOOD                              | FOOD  |
| 30 %  | GRAINS<br>59.5 %                                | GRAINS<br>59.2 %            | GRAINS<br>54.6 %  | GRAINS<br>58.2 %                                     | GRAINS<br>70.4 %                                     | GRAINS<br>77.2 %          | GRAINS<br>58.1 %                  | GRAINS<br>58.5 %                              |
| 20 %  |   |                             |   |  |  |                           |                                   |   |
| 10 %  |   |                             |   |  |  |                           |                                   |   |
| 0     |   |                             |   |  |  |                           |                                   |   |

NOTE:- Melon and Cotton areas have been grouped together because the former is only in extremely rare cases



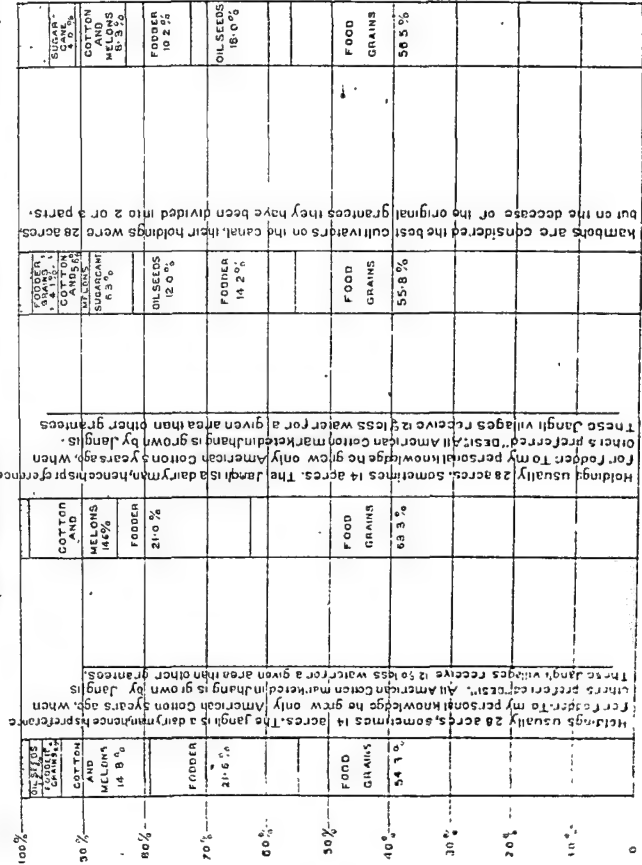
DIAGRAM COMPARING THE PERCENTAGES OF THE CHIEF CROPS IRRIGATED IN VILLAGES  
CULTIVATED BY DIFFERENT CLASSES OF CULTIVATORS DURING THE YEAR 1915-16.

MOUZA No. 191 JHANG BRANCH,  
Cultivated by Junglis or Barromas.

MOUZA No. 195 JHANG BRANCH,  
Cultivated by Junglis or Barromas.

MOUZA No. 204 JHANG BRANCH,  
Cultivated by Sikh Ramtois.

MOUZA No. 353 JHANG BRANCH,  
Cultivated by Sared Posh or  
Tomen Grantses.





## RABI 1916-17

|                                  |  |
|----------------------------------|--|
| GREAT MILLET                     |  |
|                                  |  |
| RAWAN                            |  |
| OTTON                            |  |
| OTTON & MELONS<br>MAIZE<br>MAIZE |  |
| CHINA                            |  |
| GREAT MILLET                     |  |
| MELONS<br>OTTON                  |  |
| OTTON                            |  |

55-0-9 36-0-9  
35-1-0

|         |                          |        |                       |       |
|---------|--------------------------|--------|-----------------------|-------|
| BARLEY  | WHEAT                    |        | WHEAT                 | WHEAT |
|         |                          |        |                       |       |
| WHEAT   | WHEAT                    |        | WHEAT                 | WHEAT |
|         |                          |        |                       |       |
| TURNIPS | TURNIPS                  |        | METHRA                | WHEAT |
|         |                          |        |                       |       |
| TURNIPS | TURNIPS                  |        | SENJI & LUCERNE GRASS | WHEAT |
| TURNIPS | TURNIPS<br>LUCERNE GRASS | METHRA |                       | WHEAT |
| WHEAT   | WHEAT                    |        |                       | WHEAT |
|         | BARLEY                   |        |                       |       |
| WHEAT   | WHEAT                    |        |                       | WHEAT |

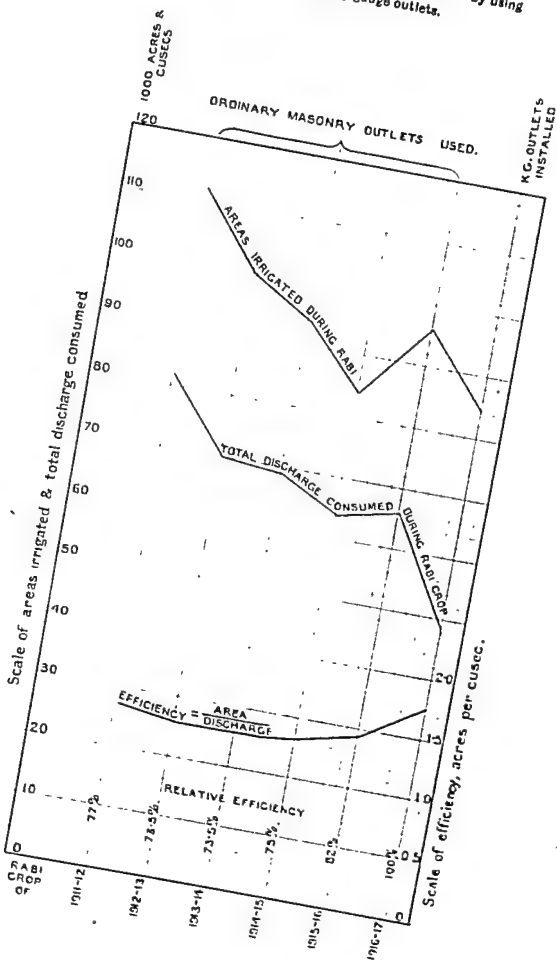
TOTAL REVENUE ASSESSED 66-13-6  
WATER RATE 71-12-0

|  |  |  |       |      |      |       |        |
|--|--|--|-------|------|------|-------|--------|
|  |  |  | WHEAT | RAPE | RAPE | WHEAT | WHEAT  |
|  |  |  |       |      |      |       | BARLEY |



# LOWER CHENAB CANAL HAFIZABAD DIVISION

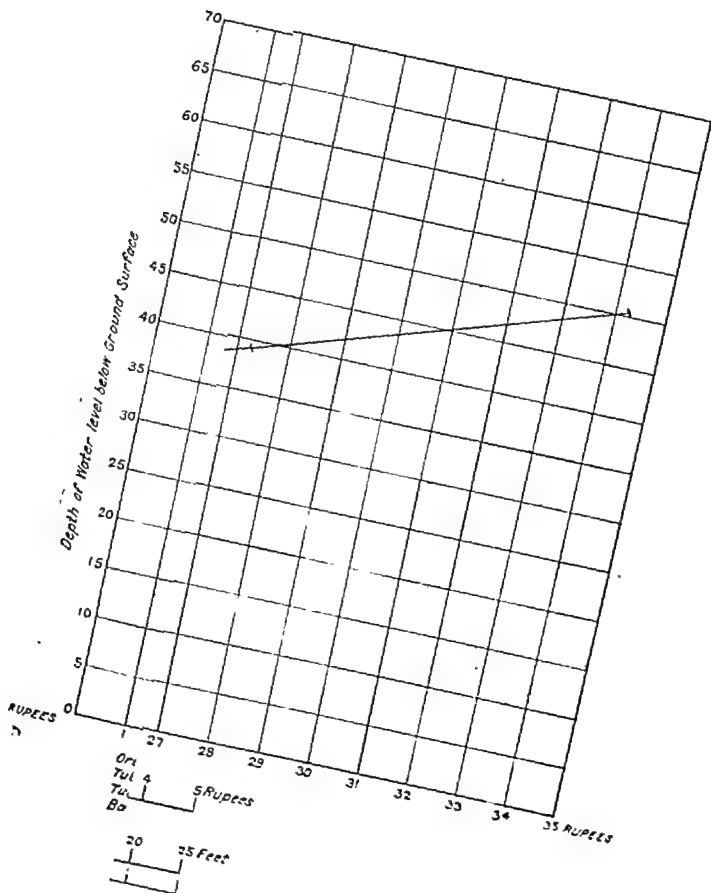
Diagram illustrating efficiency attained by using  
Kennedy gauge outlets.



C. E. NAY,  
Executive Engineer,  
Project Division Lower Chenab Canal,  
3rd January, 1918.













G.R.

